UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,231	10/14/2003	Manu Gulati	BP3248	4627

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EXAMINER
CHU, WUTCHUNG

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/685,231	GULATI ET AL.
	Examiner	Art Unit	
	WUTCHUNG CHU	2619	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>29 July 2008</u>.

2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
      closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-7,9-15,17,19 and 20</u> is/are pending in the application.

     4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-7,9-15,17,19 and 20</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

     a) ☐ All   b) ☐ Some * c) ☐ None of:

         1. ☐ Certified copies of the priority documents have been received.

         2. ☐ Certified copies of the priority documents have been received in Application No. _____.

         3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
            application from the International Bureau (PCT Rule 17.2(a)).

     * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
     Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
     Paper No(s)/Mail Date. _____

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1.   A request for continued examination under 37 CFR 1.114, including the fee set

forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this

application is eligible for continued examination under 37 CFR 1.114, and the fee set

forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action

has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on

7/29/2008 has been entered.

Response to Amendment

2.   This communication is in response to application's amendment filed on

7/29/2008. Claims 1-7, 9-15, 17, 19-20 are pending, and claims 8, 16, 18, and 21 are

canceled.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public
> use or on sale in this country, more than one year prior to the date of application for patent in the United
> States.

4.   Claims 1-6, 9-15, 17, 19 are rejected under 35 U.S.C. 102(b) as being

anticipated by Cremin et al., hereinafter Cremin, (US2002/0018444).

    Regarding claim 1, Cremin discloses a method and apparatus for multi-lane

communication channel with deskewing capability **(see paragraph 21)** comprising:

- a data aligner to receive data **(see figure 6 box 623 data alignment)**, having a
  first data format of a first byte-length granularity and a second data format of a
  second byte-length granularity where the first and second byte-length granularity
  are different **(see paragraphs 22 and 23 where 48 bit input word at input,
  increases the width of the data word being processed by the
  communication channel to 64bits)**, from a data transmission link having a first
  data width **(see paragraph 22 48 bit input word)** and to align the data into
  predefined segments for interim storage **(see figure 2 ref223a and paragraph
  31 data alignment units)**, based on storage devices in which each storage
  device has a single read port and a single write port of a fixed byte length **(see
  figure 8 FIFO 801-803 where it is inherent for FIFO to have write port and
  read port for it to read and write data as discloses in paragraph 26)**; and

- a buffer **(see figure 8 and ref 801-3 queues)**, formed from the storage devices,
  to receive aligned data from the data aligner for interim storage and to
  reassemble data output onto a data path having a second data width that is wider
  than the first data width **(see paragraphs 23 and 27 64 bit input word, and
  after a 64 bit word is read from the queue it is fanned out in pieces to each
  of the eight lanes and also see figure 2 where input comes in as 48bit arrow
  202, and leaves the queue arrow 207 in 64 bit word)**, the buffer to allow
  storage of aligned data in wider format **(see paragraph 70 word width
  expansion unit and figure 2 ref 208)** to maintain sufficient bandwidth to account
  for frequency scaling of received data rate to frequency of the data path, based

on the first and second byte-length granularity of the received data, and process fragmentation of data for alignment onto the data path **(see paragraph 39 the input word expansion unit can only provide information at a data rate sufficient to fill fifteen units)** by storing the fragmentation in a next selected storage device, the buffer to use the storage devices **(see figure 8 ref801-3 and paragraph 68 FIFO queues)** in a cyclic manner **(see paragraph 59 rotating multiplexing)** based on the byte-length granularity of the received data, in which buffering of the received data of different byte-length granularity **(see paragraphs 22-24)** is achieved using storage devices having the single read port and the single write port **(see figure 8 FIFO 801-803 where it is inherent for FIFO to have write port and read port for it to read and write data as discloses in paragraph 26 a memory having logic that reads and writes data from /to the memory in a manner that is consistent with the operation of a queue)**.

Regarding claim 2, Cremin teaches the storage devices are arranged in arrays **(see figure 8 ref801-3)**.

Regarding claim 3, Cremin teaches further including a command control logic to separate commands from data at an input to the data aligner and to process commands to align the data **(see paragraph 57)**.

Regarding claim 4, Cremin teaches further comprises a data re-aligner at the buffer output, data entry may start in any one of the arrays and an orientation bit or bits is to

be used to identify the starting array for realignment in the data re-aligner **(see figure 8 ref801-3 and paragraph 68-69)**.

Regarding claim 5, Cremin teaches further including a meta-data unit to receive meta-data from the command control logic and to use the meta-data to realign the data in the data re-aligner **(see paragraph 68-69)**.

Regarding claim 6, Cremin teaches further comprising a data fragment collector to collect fragments of data that do not fit into the predefined segment in one clock period and to use the fragment in a next clock period to fit into a next segment **(see paragraph 22)**.

Regarding claim 9, Cremin teaches an integrated circuit comprising:

- an interface unit to receive incoming data from a higher frequency data transmission link having a first data width **(see paragraph 22 48 bit input word and figure 2 arrow 202)** for use by the integrated circuit **(see figure 2 box 202 and paragraphs 22 and 81)**, the incoming data having a first data format of a first byte-length granularity and a second data format of a second byte-length granularity where the first and second byte-length granularities are different **(see paragraphs 22 and 23 where 48 bit input word at input, increases the width of the data word being processed by the communication channel to 64bits);**

- a command control unit to receive incoming data from the interface unit and to separate commands from data to process commands to align the data **(see paragraph 57)**;

- a data aligner to receive incoming data from the interface unit and to align the incoming data into a predefined segment for interim storage **(see figure 2 ref223a and paragraph 31 data alignment units),** based on storage devices in which each storage device has a single read port and a single write port of a fixed byte length **(see figure 8 FIFO 801-803 where it is inherent for FIFO to have write port and read port for it to read and write data as discloses in paragraph 26)**; and

- a reassembly buffer**,** formed from the storage devices **(see figure 8 and ref 801-3 queues)**, to receive aligned data from the data aligner for interim storage and to reassemble data output onto an internal data path having a second data width that is wider than the first data width **(see paragraphs 23 and 27 64 bit input word, and after a 64 bit word is read from the queue it is fanned out in pieces to each of the eight lanes and also see figure 2 where input comes in as 48bit arrow 202, and leaves the queue arrow 207 in 64 bit word)**, the reassembly buffer to allow storage of aligned data in wider format **(see paragraph 70 word width expansion unit and figure 2 ref 208)** to maintain sufficient bandwidth to account for frequency scaling of received data rate to frequency of the internal data path,

- based on the first or second byte-length granularity of the received data, and
  process fragmentation of data for alignment onto the internal data path **(see
  paragraph 39 the input word expansion unit can only provide information at
  a data rate sufficient to fill fifteen units)** by storing the fragmentation in a next
  selected storage device, the buffer to use the storage devices **(see figure 8
  ref801-3 and paragraph 68 FIFO queues)** in a cyclic manner **(see paragraph
  59 rotating multiplexing)** based on the byte-length granularity of the incoming
  data, in which buffering of the incoming data of different byte-length granularity
  (see paragraphs 22-24) is achieved using storage devices having the single
  read port and the single write port **(see figure 8 FIFO 801-803 where it is
  inherent for FIFO to have write port and read port for it to read and write
  data as discloses in paragraph 26 a memory having logic that reads and
  writes data from /to the memory in a manner that is consistent with the
  operation of a queue).**

Regarding claims 10, 12-14, Cremin disclose all the limitations as discussed in
the rejection of claims 2, 4-6 and are therefore claims 10-16 are rejected using the
same rationales.

Regarding claim 11, Cremin the reassembly buffer is structured having multiple
matrices arranged into arrays, in which a width of the individual matrix is determined by
the second data width of the **(see paragraphs 23 and 27 64 bit input word, and after
a 64 bit word is read from the queue it is fanned out in pieces to each of the eight
lanes and also see figure 2 where input comes in as 48bit arrow 202, and leaves**

the queue arrow 207 in 64 bit word) internal data path **(see Cremin paragraph 57**

and 70).

        Regarding claims 17 and 19, Cremin disclose all the limitations as discussed in

the rejection of claims 1 and 4 and are therefore claims 17-19 are rejected using the

same rationales.

Claim Rejections - 35 USC § 103

5.   The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

>   1.   Determining the scope and contents of the prior art.
>   2.   Ascertaining the differences between the prior art and the claims at issue.
>   3.   Resolving the level of ordinary skill in the pertinent art.
>   4.   Considering objective evidence present in the application indicating
>   obviousness or nonobviousness.

6.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

>   (a) A patent may not be obtained though the invention is not identically disclosed or described as set
>   forth in section 102 of this title, if the differences between the subject matter sought to be patented and
>   the prior art are such that the subject matter as a whole would have been obvious at the time the
>   invention was made to a person having ordinary skill in the art to which said subject matter pertains.
>   Patentability shall not be negatived by the manner in which the invention was made.

7.   Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Cremin in view of Richter (US2003/0099254).

        Regarding claim 7, Cremin discloses disclose all the subject matter of the

claimed invention with the exception of first data format is based on SPI-4 protocol and

the second data format is based on HyperTransport protocol.

Richter from the same or similar fields of endeavor teaches the use of SPI-4 **(see Richter paragraph 141)** and HyperTransport **(see Richter paragraph 117)**.   Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to use the SPI-4 and HyperTransport as taught by Richter in the apparatus for multi-lane communication channel with deskewing capability of Cremin in order to provide optimization for a particular system application, providing further performance improvements **(see Richter paragraph 117)**.

Regarding claims 15, Cremin disclose all the limitations as discussed in the rejection of claims 7 and is therefore claims 15 is rejected using the same rationales.

Regarding claims 20, Cremin disclose all the limitations as discussed in the rejection of claim 7 and is therefore claim 20 is rejected using the same rationales.

Response to Arguments

8.   Applicant's arguments filed 7/29/2008 have been fully considered but they are not persuasive.

With regard to applicant's remark for claims 1, 9, and 17 (page 7), applicant submits that the Cremin fails to teach "a first data width, in which a first data format is of a first byte-length granularity and a second data format is of a second byte-length granularity, where the first and second byte-length granularities are different".

Cremin in figure 2 illustrates a arrow 202 48 bit input and arrow 207 64 bit output, which corresponds to the first and second data format where second data format is wider than the first, which is also stated in paragraphs 22-27, and thus meets the limitation and rejection respectfully remains.

Conclusion

9.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure.

Wu (US2003/0095563)

Lalmiki et al. (US6975324)

10.   Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MEPP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

        A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.

        Any inquiry concerning this communication or earlier communications from the

examiner should be directed to WUTCHUNG CHU whose telephone number is

(571)270-1411. The examiner can normally be reached on Monday - Friday 1000 -

1500EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edan Orgad can be reached on 571 272 7884. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/WC/
Wutchung Chu

/Edan Orgad/

Supervisory Patent Examiner, Art Unit 2619